

U.S. Environmental Protection Agency Natural Gas STAR Program

Gas STAR Online BMP Management System

Brian Boyer - COMM Engineering, Steve O'Connell - Devon Energy Corp., Gerry Knapp – Louisiana State University



Overview

- ★Web-based BMP Management and Reporting Tool for Methane Reductions
- ★Funded by Devon Energy Corporation
- Developed by COMM Engineering and Louisiana State University − Dr. Gerry Knapp

Overview

- ★ Rationale
 - Centralize data eliminate spreadsheets
 - Access from anywhere
 - Simplify reporting
 - Simplify management
- ★Application code will be available for free to industry through EPA



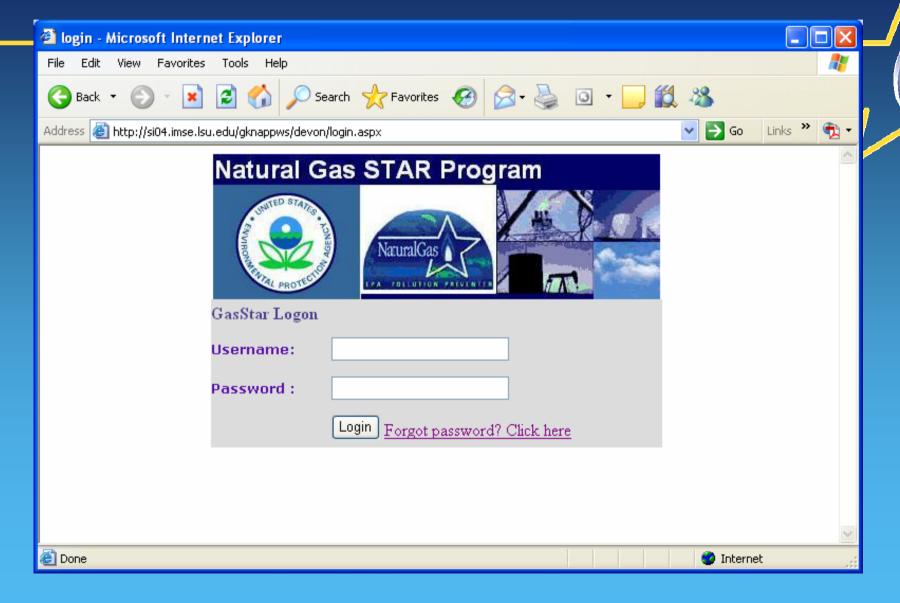
BMPs Covered

- **★** AOF Tests
- ★ Convert Engine Starting to N2
- ★ Flares
- ★ Gas Controls to Instrument Air
- ★ Generic Reductions
- ★ Glycol Dehy Reductions
- ★ Green Completions
- ★ Install Static Pacs at Compressor Station

- ★ Plunger Lift
- → Pneumatic Controllers
- ★ Reduce Glycol Circulation Rate
- ★ Replace Gas with Electric Glycol Pump
- ★ Replace NG Engine with Electric Motor
- ★ Replace Wet Seals with Dry Seals
- ★ Vapor Recovery Units (VRUs)



Login Screen



BMP Management System – Main Screen



Grouping: Div/Fld/Fac

Save Edits

South Texas

House Creek Field Indian Basin Permian Rockies

E Western

Add new E	Add new BMP Add new / go to detail * - indicates required field for adding a new record					
Division	Western	► BMP Type	Green Completions	~	Number of Occurrences	4
Field	House Creek Field	★ Start Date:	8/27/2005	*	Reduct. per Occur. (Mcf)	625
Facility	House Creek Sussex Unit E	Compl. date:		\blacksquare	Total Reduction (Mcf)	2500
We11	(select well [opt])	Description		^		
				~		

크 Facility:Ho	Facility:House Creek Sussex Unit Battery								
	Well	Туре	Brief Desc	Start date	End date	Num Occur	ARR/occ(Mcf)	Total ARR(Mcf)	Detail
Delete		Static Pac		10/15/2002		4	3.81	15.25	view/ed
Delete		Green		08/15/2005				200	view/ed
Delete		Generic		11/15/2003		4	3.68	14.7	view/ed
Delete		Dry Seal		04/15/2003		3	44.13	132.39	view/ed
Delete		NG Engine		11/15/2004		3	33.39	100.17	view/ed
Delete		Gly Pump		10/15/2004		3	29.98	89.93	view/ed
Delete		AOF		08/15/2005		1	66	3.96	view/ed
Delete		AOF		08/15/2005				66	view/ed
Delete		AOF		08/15/2005				66	view/ed
Delete		Inst Air		09/15/2002		4	30.46	121.83	view/ed
Delete		N2		12/15/2004		4	50	200	view/ed
Delete		N2		03/15/2003		1	39.04	39.04	view/ed
크 Facility:So	uth Battery (i	House Creek Field)							
	Well	Туре	Brief Desc	Start date	End date	Num Occur	ARR/occ(Mcf)	Total ARR(Mcf)	Detail:
Delete		Green		02/15/2004		3	34.9	104.69	view/ed
Delete		Green		09/15/2003		2	9.14	18.28	view/ed
Delete		Dehy Reduc		07/15/2005		4	15.22	60.9	view/ed

BMP Management System – BMP Detail / Calcs

Natural Gas STAR Program









- * indicates required field
- <u>■ Location</u> (Western > House Creek Field > South Battery (House Creek Field))
- Project Information

In Service (Start) Date

Completion (End) Date

Est. Duration (yrs)

Number Units Installed

Mole Fraction (%)

ARR Per Unit (Mcf/yr)

ARR (Mcf/yr)

Calculation Method

Brief Description

Planned Future

Activities

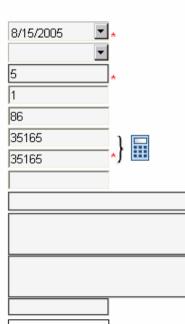
Comments /

Additional Benefits

Gas Price (\$/Mcf)

Total Value Gas Saved (\$)

Project Present Worth (\$)



BMP Detail / Calcs

Natural Gas STAR Program





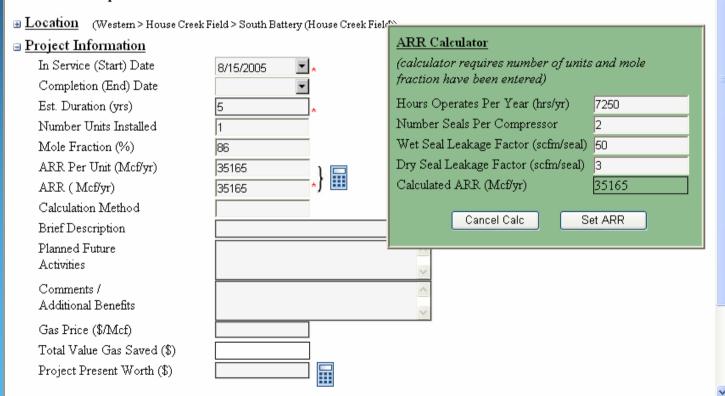






BMP: Replace Wet Seals with Dry Seals

* - indicates required field



BMP Detail / Calcs

Natural Gas STAR Program









BMP: Replace Wet Seals with Dry Seals

* - indicates required field

<u>■ Location</u> (Western > House Creek Field > South Battery (House Creek Field >)

8/15/2005

86

35165

35165

204448

■ Project Information

In Service (Start) Date

Completion (End) Date

Est. Duration (yrs)

Number Units Installed

Mole Fraction (%)

ARR Per Unit (Mcf/yr)

ARR (Mcf/yr)

Calculation Method

Brief Description

Planned Future

Activities

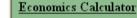
Comments /

Additional Benefits

Gas Price (\$/Mcf)

Total Value Gas Saved (\$)

Project Present Worth (\$)



(calculator requires duration, number of units, mole fraction, ARR, and gas price have been entered on the main form, and that all values on the ARR calculator have been entered)

Annual Add. Gas Revenue (\$/yr)

Wet Seal Condition

Shaft Diameter (in.)

Wet Seal Cost Factor (\$/in/seal)

Wet Seal Salvage Per Unit (\$)

Dry Seal Cost Factor (\$/in/seal)
Dry Seal Cost Per Unit (\$)

Install/Eng Cost per unit (\$)

Total Initial Project Cost (\$)

O&M Cost Per Unit (\$/yr)

Total Annual Cost (\$/yr)
Total Annual Net Revenue (\$/yr)

Project Hurdle Interest Rate (%)

Project Present Worth (\$)

204448

functional 6

5167 20668

10351

124213

227757

10326 -65057

269505

743748

12

Cancel Calc

Set PW



BMP Detail / Calcs

Natural Gas STAR Program







BMP: Low Bleed Pneumatic Controllers

* - indicates required field



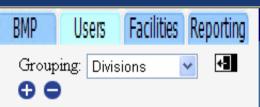
- 5 X 5 - K X D W

■ Location (Western > House Creek Field > South Battery (House Creek Field) ARR Calculator ■ Project Information (requires number occurrences be entered) Installation Type Upgrade In Service (Start) Date 10/15/2004 Before - Make/Model Fisher 4100 Completion (End) Date Before - Gas Emission Rate (scfh) 50 Est. Duration (yrs) After - Make/Model Fisher 4195 Number Occurrences After - Gas Emission Rate (scfh) 3.5 Mole Fraction (%) 91.39 Calculation Method ARR Per Occurrence (Mcf/yr) 372.25 Hours of Operation Per Year 8760 ARR (Mcf/yr) 2978 Calculated ARR (Mcf/yr) 2978 Brief Description Cancel Calc Set ARR Planned Future Activities Comments / Additional Benefits Cost (Project) 8000 Gas Price (\$/Mcf) Total Value Gas Saved (\$) 16293 Project Hurdle Rate (%) Project PW (\$)



User Management





(add new user)

- **⊞** Gulf
- Southern

Boyer, Brian

E Western

Knapp, Gerry O'Connell, Steve

Natural Gas STAR Program









(new user)



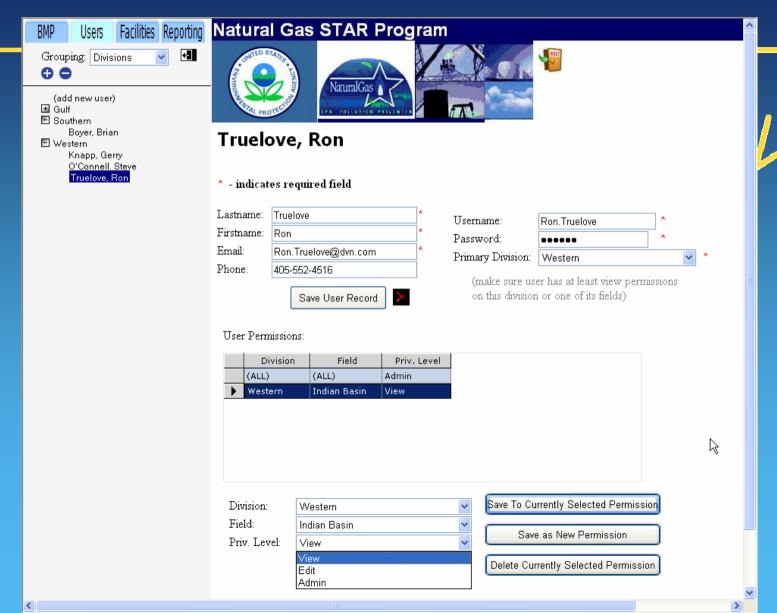
* - indicates required field

Lastname:	Truelove
Firstname:	Ron
Email:	Ron.Truelove@dvn.com
Phone:	405-552-4516
	Save User Record

Username:	Ron.Truelove	*	
Password:	•••••	*	
Primary Division:	Western		v

(make sure user has at least view permissions on this division or one of its fields)

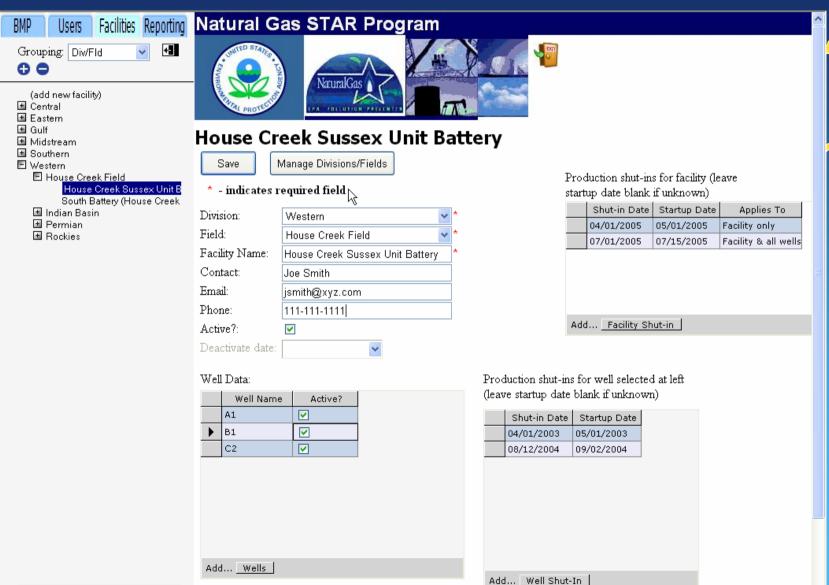
User Management



User Management

- **★**Manage existing users
- ★Assign access levels administration, view, edit.
- ★Administration the highest access level control of all assignment of user access
- → Displays all users and displays users by Divisions

Facilities Management



Facilities Management

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Divisions / Fields

Division	Field	Active	Deactivate Date
Central	FWB	✓	
Southern	Carthage	▽	
Southern	Groesbeck	✓	
Southern	South Texas	▽	
Western	House Creek Field	✓	
Western	Indian Basin	▽	
Western	Permian	✓	
Western	Rockies	▽	

Add... Divisions



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Mcf Reductions - Reporting



- Division Field Facility Well All Detail EPA Ongoing Shut-Ins

Include BMP type?

Dates Covered:

- Year:
- 2005
- Date Range:

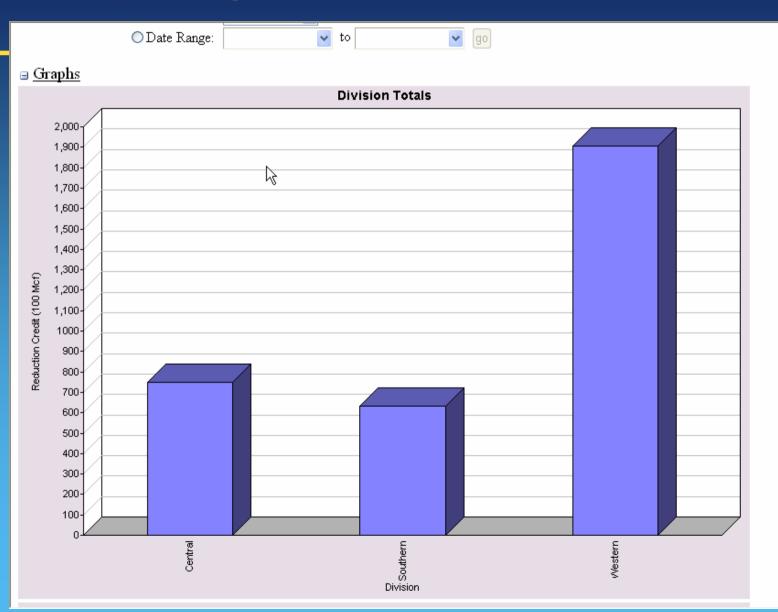




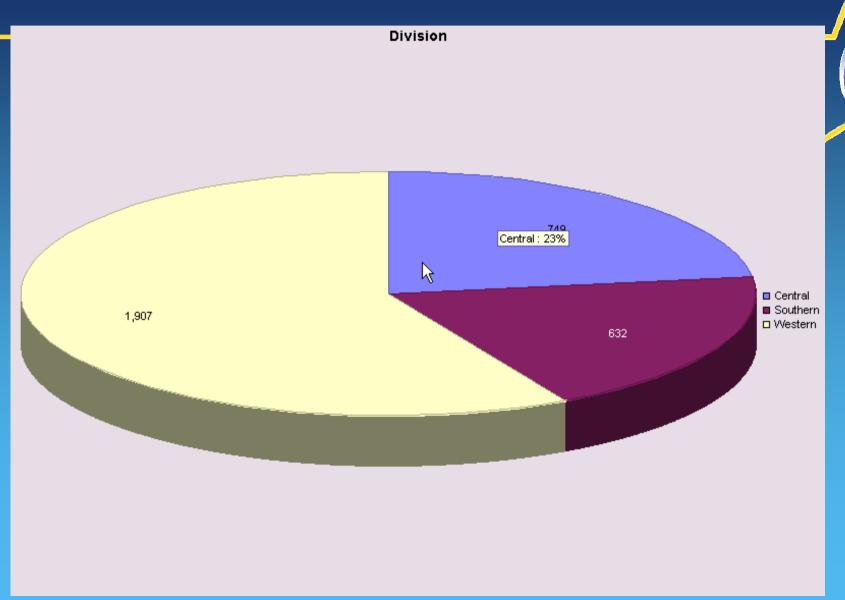


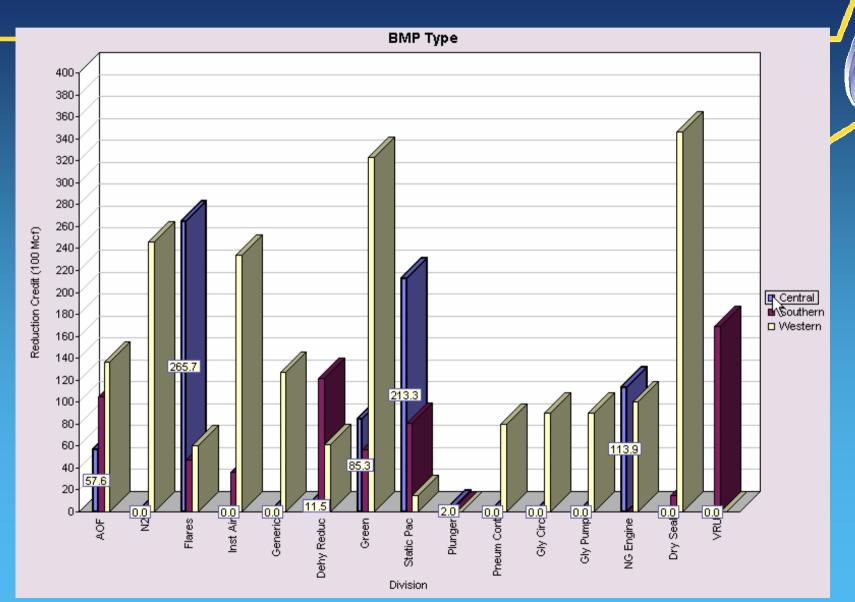


<u>Summary</u>













ODate Range:

v to

J	Graphs
	Summer

Division	ВМР Туре	Mcf Credit
Central	AOF Test	57.56
	Convert Engine Starting to N2	0.00
	Flares	265.69
	Gas Controls to Instrument Air	0.00
	Generic Reduction	0.00
	Glycol Dehy Reductions	11.52
	Green Completions	85.33
	Install Static Pacs at Compressor Station	213.34
	Plunger Lift	2.02
	Pneumatic Controllers	0.00
	Reduce Gly Circ Rate	0.00
	Replace Gas with Electric Gly Pump	0.00
	Replace NG Engine with Electric Motor	113.92
	Replace Wet Seals with Dry Seals	0.00
	VRU	0.00
	DIVISION TOTAL:	749.38
Southern	AOF Test	105.27
	Convert Engine Starting to N2	0.00
	Flares	47.17
	Gas Controls to Instrument Air	36.06
	Generic Reduction	0.00
	Glycol Dehy Reductions	121.73
	Green Completions	56.77
	Install Static Pacs at Compressor Station	81.01
	Plunger Lift	0.00
	I Imiger DIR	
	Pneumatic Controllers	0.00
		0.00
	Pneumatic Controllers	
	Pneumatic Controllers Reduce Gly Circ Rate	0.00
	Pneumatic Controllers Reduce Gly Circ Rate Replace Gas with Electric Gly Pump	0.00
	Pneumatic Controllers Reduce Gly Circ Rate Replace Gas with Electric Gly Pump Replace NG Engine with Electric Motor	0.00 0.00 0.00
	Pneumatic Controllers Reduce Gly Circ Rate Replace Gas with Electric Gly Pump Replace NG Engine with Electric Motor Replace Wet Seals with Dry Seals	0.00 0.00 0.00 15.10 169.25
Western	Pneumatic Controllers Reduce Gly Circ Rate Replace Gas with Electric Gly Pump Replace NG Engine with Electric Motor Replace Wet Seals with Dry Seals VRU	0.00 0.00 0.00 15.10 169.25

Division Summary

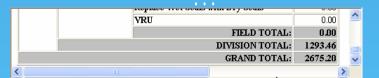
> Division/Field Summary

⊞ Graphs

■ Summary

Division	Field	ВМР Туре	Mcf Credit
Central	FWB	AOF Test	57.56
		Convert Engine Starting to N2	0.00
		Flares	265.69
		Gas Controls to Instrument Air	0.00
		Generic Reduction	0.00
		Glycol Dehy Reductions	11.52
		Green Completions	85.33
		Install Static Pacs at Compressor Station	213.34
		Plunger Lift	2.02
		Pneumatic Controllers	0.00
		Reduce Gly Circ Rate	0.00
		Replace Gas with Electric Gly Pump	0.00
		Replace NG Engine with Electric Motor	113.92
		Replace Wet Seals with Dry Seals	0.00
		VRU	0.00
		FIELD TOTAL:	749.38
		DIVISION TOTAL:	749.38
Southern	Carthage	AOF Test	0.00
		Convert Engine Starting to N2	0.00
		Flares	0.00
		Gas Controls to Instrument Air	0.00
		Generic Reduction	0.00
		Glycol Dehy Reductions	0.00
-		Green Completions	0.00
		Install Static Pacs at Compressor Station	0.00
		Plunger Lift	0.00
		Pneumatic Controllers	0.00
		Reduce Gly Circ Rate	0.00
		Replace Gas with Electric Gly Pump	0.00
		Replace NG Engine with Electric Motor	0.00
		Replace Wet Seals with Dry Seals	0.00
		VRU	0.00
		FIELD TOTAL:	00.0
	Groesbeck	AOF Test	0.00
		G . F . G 373	0.00





Conclusions

- **★**Free to industry through EPA
- ★ Easy to use web based management tool
- **★**Track methane reductions for STAR
- ★ Manage Users, BMPs and Facilities
- ★ Generate management and EPA reports



Contact Info

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